

APPENDIX 3-10

POPULATION SURVEY REPORT

3/26/97

POPULATION SURVEY REPORT

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Water: Crandall Creek

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Location: Emery County

Date: February 4, 1997

Authors: Marvin Boyer, Regional Fisheries Biologist
: Kevin Christopherson, Regional Fisheries Manager

Subject: Fish population survey

INTRODUCTION

Crandall Creek was surveyed in 1996 to collect tissue samples for cutthroat trout genetic identification and to describe the trout species, densities, and distribution. Due to an increase in activities at the Genwall Mine operation and projected expansions, Crandall Creek has been surveyed annually since 1994. In 1995 and 1996, reconnaissance surveys (one each year) were performed upstream of the known trout populations to evaluate available habitat and to search for additional cutthroat trout populations.

Crandall Creek can be functionally divided into three reaches. The downstream reach near the confluence of Huntington Creek is below a natural fish barrier and contains brown trout, rainbow trout, and cutthroat trout (phenotypes of likely hybrids).

The middle reach, adjacent to the mine, is composed of beaver ponds, pools, low gradient riffles, and high gradient riffles. This reach has been sampled in the early 1980's and annually since 1994. The unique feature of the middle reach is that it is totally isolated from upstream migration of the non-native fish that inhabit Huntington Creek and the lower reach of Crandall Creek. This isolation, due to the natural barrier in lower Crandall Creek, suggests that all the trout above the barrier are of wild stock. There are no DWR records of fish being stocked in Crandall Creek. This supports the supposition that the cutthroat trout above the barrier are likely the native sub-species *Oncorhynchus clarki pleuriticus*.

JUL 30 1997

97B

The upstream reach is a high gradient environment possessing many cascades and high gradient riffles as well as low gradient riffles and runs. This reach is deficient in nursery habitat and adult fish habitat. Due to the lack of habitat and the extreme variation in discharge, trout would not likely inhabit this poor habitat during high flow periods and/or low flow periods.

METHODS

In 1994 and 1995, fish populations were surveyed with backpack electrofishing gear. In 1996, a three pass depletion estimate for a 300 ft section of the middle reach was conducted. After completing the survey, the total length and weight of each fish were measured before they were released back into the reach.

In the upstream reach, all likely habitats were electrofished in search of cutthroat trout. Extremely high gradient areas were by-passed in order to survey the most likely spots where cutthroat trout may exist. In 1994 and 1995, slightly less than one mile of stream was surveyed (Figure 1). In 1996, more than one mile of stream was surveyed during two hours of electrofishing effort (Figure 1).

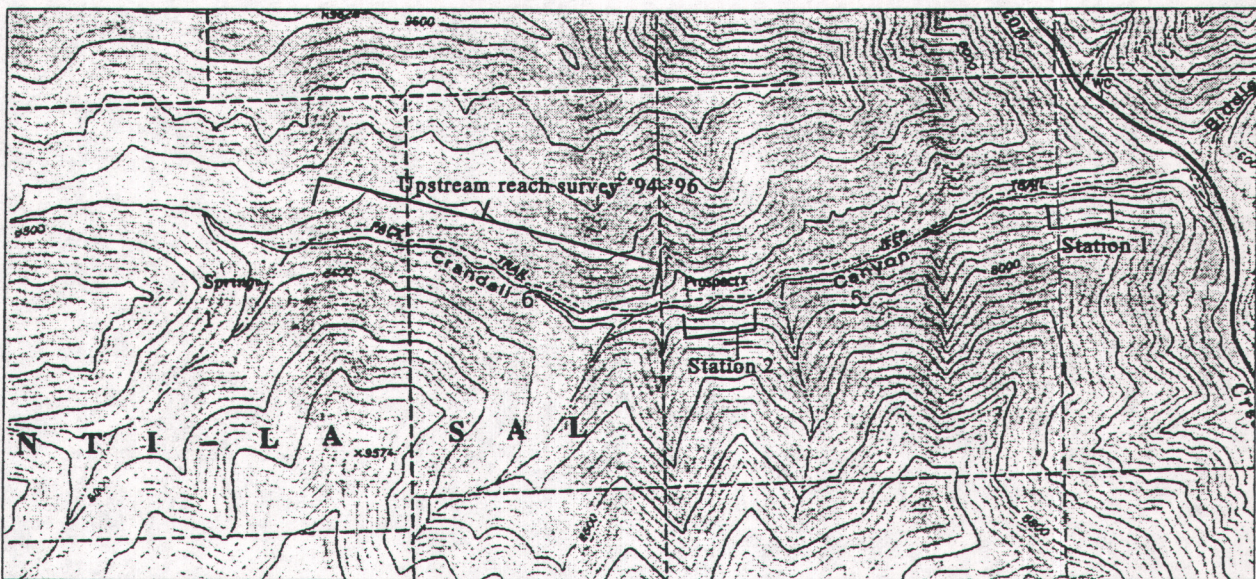


Figure 1. Map of Crandall Creek and survey stations.

JUL 30 1997

97B

Data was entered and manipulated using Quatro Pro (v5.0).
Graphics were created using Word Perfect Presentations (v3.0).
Reports were written using Word Perfect (v6.1).

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RESULTS

The reach of stream located adjacent to the mine has consistently produced wild cutthroat trout in various size classes (Figure 2). No other species were captured at station 2. The data strongly suggest that the middle reach of Crandall Creek is an important spawning and nursery area. Since the surveys were conducted in spring, summer, and fall, it is apparent that it is used throughout the growing season by all size classes represented in Figure 2.

The 1994 survey at station 2 (Figure 1) consisted of 528 feet of habitat including a large beaver pond. It was noted on the 1994 data sheets that many trout were sighted but not captured due to the depth of the beaver pond. The 1995 and 1996 results were from 300 ft sections (station 2) (Figure 1) that did not include the beaver pond (hence fewer total fish were captured). The 1996 population estimate for station 2 was 37 (± 1). Thirteen fish were collected for genetic testing and preliminary results indicate these fish are a pure strain of Colorado River cutthroat trout.

The upstream reach surveys in 1994-1996 resulted in the capture and/or sighting of zero fish. Several areas had marginal habitat for late summer conditions, but contained no fish. These marginal habitats were a small percentage of the total area.

DISCUSSION

The mining operation at Crandall Creek has been noted as a cause of concern in reports as early 1983. The concern then, was on impacting recruitment of wild cutthroat trout into Right Fork of Huntington Creek. Now an additional concern is that the small population of cutthroat trout is a remnant of the native Colorado River cutthroat subspecies. If the final results of the genetic analysis indicate a pure strain of Colorado River cutthroat trout, these fish will be instrumental in implementation of the Colorado River Cutthroat Recovery Plan. The main concern with

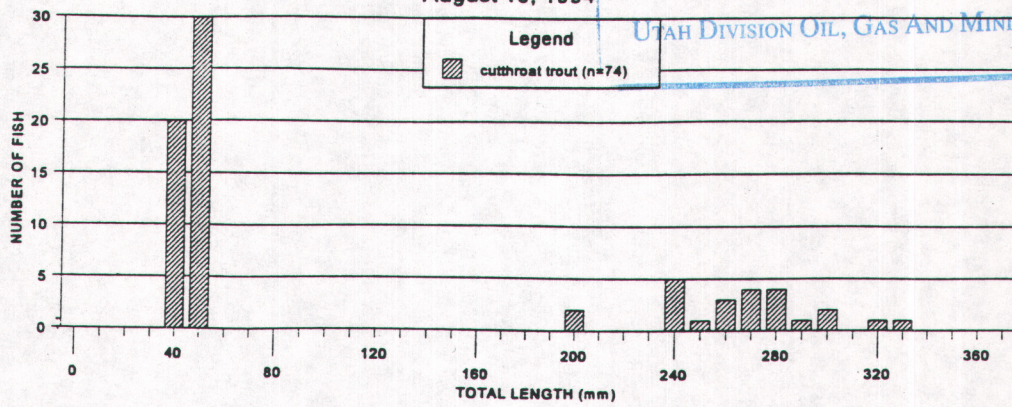
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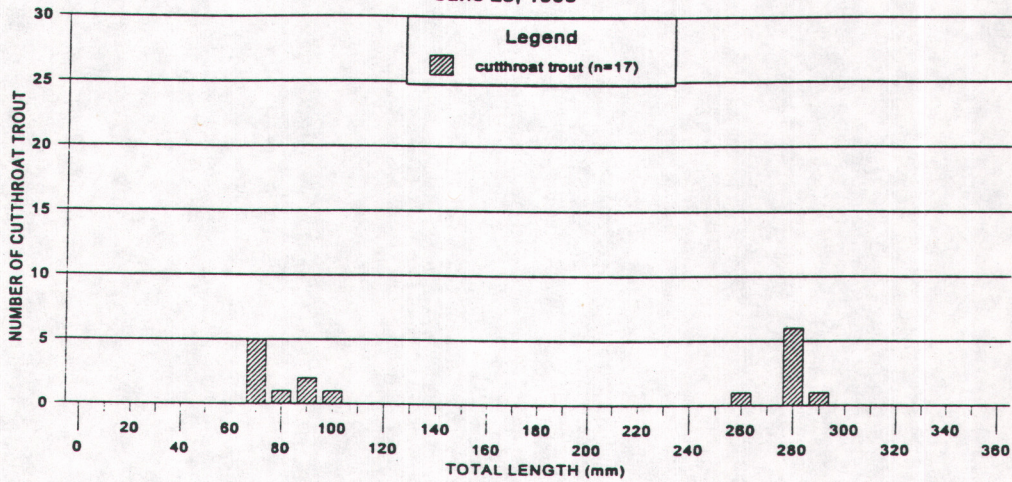
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Crandall Creek

August 18, 1994



June 23, 1995



September 19, 1996

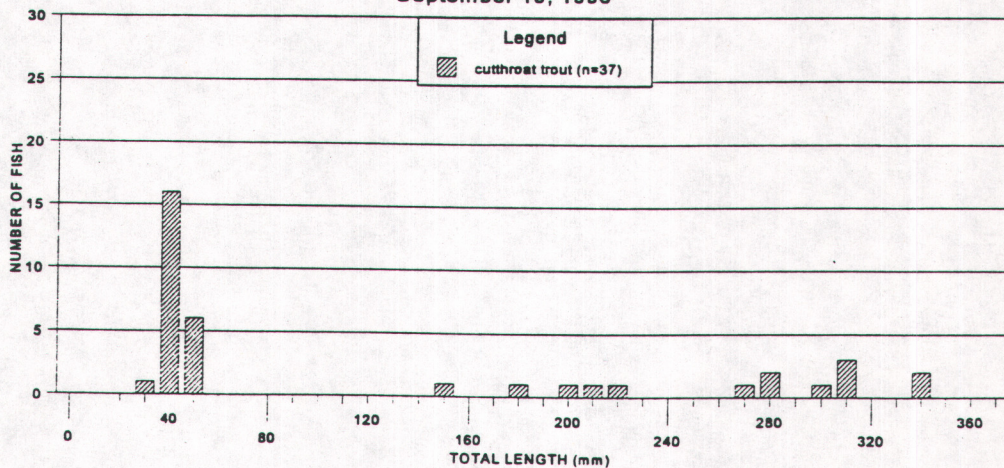


Figure 2. Length frequency of cutthroat trout from station 2 of Crandall Creek from 1994 (528' survey), 1995 (300' survey), and 1996 (300' survey).

operations at the mine is, if the wild cutthroats are displaced, they will move downstream of the barrier where they will be lost to hybridization with non-native Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) and rainbow trout which are common below the barrier located in the lower reach of Crandall Creek. Any movement of trout from the middle reach to the lower reach is a functional emigration without a chance of possible return due to the barrier. The fact that the small ephemeral upstream reach does not provide adequate habitat to support the trout residing in Crandall Creek year-round is the most likely conclusion to be drawn since there has never been a trout collected in this reach.

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